

# HELP SCREEN

## THE ANSWER TO THE MEANING OF LIFE

If you're in search of an answer to that eternal question 'what is the meaning of life', I'm afraid that you won't find it in these pages. No, that's a question that you will always have to answer for yourself. There are, however, numerous PC computing-related questions that *Help Screen* is willing to address, and you can ask what you will from the comfort of your own armchair. The answer is free and I hardly encrypt it at all – no wonder nine out of ten people prefer to write to *Help Screen*.

Unfortunately, I can't answer letters on a personal basis – only through the pages of *PC PLUS*, though I will try to acknowledge those that arrive with an SAE. It should also be noted that *Help Screen* can't accept phone calls.

However, *Help Screen* does need your input. If you're a newcomer to the exciting world of PCs or if you're branching out into new areas, then you may need a helping hand through the difficult parts – feel free to ask. All questions are welcome as the answers are usually relevant to many others.

On the other hand, the experts among you can use these pages to pass on a little learning, perhaps even to show off. See your name in print and gain some fame, all in exchange for a few lines of hard won wisdom. There will be tricks you've learned that make computing life easier, so why not let others know the problems and the solutions – they often cast light on other difficulties as well.

It doesn't matter whether you consider them important, your experiences could save someone else hours of frustration. Share the thrill of discovery with us – in all its gory detail, please – and be in with a chance of winning a total of £50 worth of real money which I'm trying to give

away every month. Send those tips to Steve Patient, *Help Screen*, *PC PLUS*, 30 Monmouth St, Bath, BA1 2BW.



Where you see this symbol, you'll find a question or a tip from someone just starting out with the PC. They might be completely new to computing, or simply changing over from some other computing environment. Whichever it is, the whole thing should be comprehensible to any reader.



This is where the wild things are. Questions and answers from the furthest reaches (and innermost depths) of computerland. Inevitably there will be material which demands explanations that we don't have the space for, but at least it offers something to get your teeth into.



Even the facile few can occasionally be baffled. You may have been using your computer for years, but that doesn't mean it can't still throw up a few surprises. This is the heading for tips on batch files, pop-ups and utilities.



**PC PLUS WARNING:** some of this material can seriously endanger your PC's health. Use this stuff wrongly and there will be tears before bedtime. Handle anything marked with this icon with extreme caution and remember that *PC PLUS* can't be held responsible for any data loss or other damage – you have been warned!



This logo precedes a letter concerning the *PC PLUS SuperDisk*. Here's where you'll find advice and tips on using the various programs and utilities found on the *PC PLUS SuperDisk*.

## WRONGLY WRITTEN



I recently bought a portable PC XT with a single 1.44 Mbyte disk drive. When I work away from my desk I have to work from floppy disks, and I carry several of these with appropriate application software and data.

On several occasions during the last few weeks I have discovered that floppy disks which claim to contain files I've worked on actually contain garbage, or parts of other files instead. Is there something wrong with the portable? I have never encountered this sort of problem on my desktop machine. Both are running MS-DOS 3.3.

Alex Morris  
Sheffield

There's almost certainly nothing wrong with the portable – in fact, the bug is in MS-DOS. For some reason, Microsoft does not consider it important to build in a feature to check whether there has been a disk change on an MS-DOS machine before altering the data – including the directory and the FAT (file allocation table). One unfortunate consequence of this is that if you change disks without telling MS-DOS, it will blithely write totally inaccurate information on to the disk.

This usually happens in one of two ways. Let's imagine that you've started editing a

file (we'll call it DANGER.DOC) from one floppy, but decide to save it to a second floppy – you simply swap disks and save it.

However, no one told MS-DOS about the new disk and it isn't about to check, so it writes it to the disk and updates the directory – but not just the bit about DANGER.DOC. It updates the entire directory and the FAT on the new disk using the copy (which it took from the original disk). Unfortunately, the original information is quite wrong on the new disk. Most of your data is still there on the disk, but gaining access to it is a skilled job.

The other way in which this usually occurs is when a user tries to modify a write-protected disk. You think, 'right, I'll just delete all the BAK files on this data disk', but you then pick up the wrong disk – a write-protected one – instead. MS-DOS reads the directory tracks, tries to delete the files and finally announces that the disk is write protected. You get the usual message offering to 'Abort, Ignore or Fail', realise it's the wrong disk, shove in the right one and wait politely while MS-DOS writes the directory information from the first disk over that on the second.

The easiest way to protect yourself against this bug is to get into the habit of always logging in a new disk when you insert it in the drive; just do a DIR at the command line or get your application to do one and there'll be no problem.

## WINDOWS ACCOUNTING



I am an accountant dealing mainly with sole traders and service-orientated companies.

The *Windows 3.0 Graphical User Interface (GUI)* looks as if it provides sufficient facilities for all my word processing and client list needs along with the *Windows*' utilities *Write* and *Cardfile*. Therefore I'm just left looking for an accounting package which will run in the *Windows* environment. Is there such a thing? I will be using an 386SX computer

Roger Marsh  
London SW12

Yes, any PC accounting system will run under *Windows* since it will run virtually all existing MS-DOS programs perfectly well, switching between a *Windows* environment and an MS-DOS one with a single combination key press. In addition there is at least one genuine *Windows* accounting suite available from a company called MAP (061-624 5662).

*Write* and *Cardfile* aren't usually considered to be serious applications since they lack features like the ability to perform an automated mail merge, but I see people using them without worrying whether anyone will laugh at them for not being a power user. Why pay more if you really don't need more?

## CATCH UP



Having started off with an Amstrad PC1640, I now wish to upgrade to a 386SX colour machine. I have studied your reviews with interest, but find that machines that you test which meet my requirements cost around £2,000.

Yet in February's PC PLUS, I see Multiplex offering a 386SX with 4 Mbytes of RAM, colour VGA, 65 Mbyte hard disk and two floppies for just £1,399. What's the catch?

J Hunt  
Huddersfield

There is no catch. Let's add it up – if you hunt around you can get the components separately, mail order, for prices not unlike these: Colour VGA monitor £250, VGA adaptor card £60, a 65 Mbyte hard disk £250, 20MHz 386SX motherboard £300, Two floppies £150, Case and power supply £70, 4 Mbytes of RAM £120, Keyboard £50, Sundry parts £100. The grand total of this little lot is £1,350

All right, this is pushing it slightly, but not too hard – I'd be surprised if the cost to a major PC manufacturer of making such a machine is over £750. Allow the manufacturer, the distributor and the retailer a working profit, and you get to the kind of figure that you're talking about. The trick for you and me is to buy a machine from a major manufacturer as near to source as possible – every step adds cost.

Companies selling more expensive machines will point to higher quality peripherals (monitor and hard disk usually) and better after sales service. Of these,

after sales service adds the most – don't pay for it if you don't need it.

## DIRECTORY FUN



If you use a DIR command with one star it will list all the sub-directories while ignoring files.

D Crooke  
Manchester

It actually lists all filenames without a filetype, and since sub-directories are just special files, it lists those. However, at least one company, Locomotive, insists on giving sub-directories a filetype – try this instead:

```
DIR | FIND "<DIR>"
```

This lists any directory listing line with a sub-directory on.

## HARD DRIVES



Last year, I purchased an Olivetti PCS86 with a single floppy disk drive. I'm pleased with the computer, but would like to add a hard disk of about 40 Mbytes. Since the PCS86 has only three slots (one of which already has a joystick adaptor fitted) I would prefer to fit a hard drive rather than a hard card. Is the above feasible?

John Rennie  
Cleveland

A hard disk can be mounted in a disk slot (used for floppy disks, hard disks, tape drives and so on), on a card, or even stuck on to the side of the box – it makes no

difference to the disk itself. However, regardless of where the disk goes, you must have a hard disk controller.

In the case of the PCS86, Olivetti tells me that an IDE controller is built on to the motherboard. It's designed to suit the Connors CP3026 20 Mbyte hard disk. Any Olivetti dealer will get you the drive and the appropriate power and data cables.

If you want a larger drive, then you must purchase a hard disk and a suitable, matching hard disk controller card – which will consume another slot in the same way as a hard card.

## THE SAME BUT DIFFERENT



A lot of PCs have drive A: as a 3.5-inch these days – with a 5.25-inch drive B:. If this causes problems with programs on 360K disks that will only install from A: use the ASSIGN command.

```
ASSIGN A=B
```

Michael Mathews  
Leamington Spa

Remember that FORMAT and DISKCOPY ignore any alterations made using ASSIGN.

## ACRONYMS AGAIN



What does the acronym TTL mean. I've often seen it in PC PLUS when monitors are mentioned. Why is it important whether a monitor is TTL or not?

Roger Walker  
Colchester

## SOUNDS INTERESTING



How can I program the PC to produce sounds? I know there are PLAY commands in the GW-BASIC programming language, but I'm rather more interested in doing it in a compiled language or Assembler as I want to use sounds in my own games.

L Harvey  
Guildford

The MS-DOS sound generating facilities are often derided and indeed they are rather pathetic. There aren't even any interrupts or BIOS calls available for producing them. That means that the only way to get at sounds is to program 'the metal' directly, that is the underlying hardware of the computer. Fortunately, this process isn't too difficult.

There are two ways to generate sound via the hardware – one is to use the facilities on offer from the PIT (Programmable Interrupt Timer) and the other is to manipulate the PC's speaker directly. Let's take the easy option first.

If we use the PIT, then it does most of the work while the microprocessor can get on with something else – like running another program. The limitation is that the PIT is only really useful for producing notes, and it begins to fail when you try to use it to produce any really complex sounds such as speech.

The Programmable Interrupt Timer has three counters – 0, 1 and 2 – though you're only allowed to make use of timer 2 for sound production. This has a two byte register. The timer counts clock ticks, and when they reach the value in this register the timer clicks the speaker once. Since the timer is counting ticks from the second counter – which runs at a frequency of 1.193180Mhz – it is possible to make these speaker clicks reach silly frequencies.

To determine the speaker note the value in the timer 2 register is worked out using the following formula:

```
VALUE=TIMER FREQUENCY/SOUND FREQUENCY
```

So, for example, to get middle C we would have to put the value:

```
1193180
—— = 4561.085
261.6
```

Since we can only use integer values, we will have to use 4561 and risk offending musical purists.

Loading the timer 2 register with the required value is a little tricky. It's a three stage process: first tell the register something is coming, then supply the low byte and then the high byte. We tell the register to expect a new value by performing an OUT 43H with a value of B6H. Then we write the two bytes to port 42H one after the other. Well and good, but nothing is happening because we haven't turned the speaker on.

To turn the speaker on we perform another OUT, this time to port 61H. However, the value held at this port address is used for many things and we're only allowed to alter bit 0 and bit 1 here.

If bit 0 is set, then the speaker is controlled by timer 2, otherwise it's being directly programmed (see below). Bit 1 is set to turn the speaker on and unset to turn it off – we want both bits set on. To do this we read the port, or the contents with 03 and write the value back again, and to turn the speaker off we AND it with FCH. All this is simple but fiddly.

Luckily, most high-level languages support IN and OUT, so you don't have to do all this in Assembler. This simple C program shows the whole process very simply. With these essentials you can program the PIT to your heart's content.

```
#include <stdio.h>
```

```
long freq=1193180; /*frequency of timer*/
int port61, port43, port42;
```

```
main()
{
```



## ALL FOR ONE



Many people, like me, have a dozen or more small batch files to call particular applications on their hard disk. Although each is probably only a few bytes long, each takes up 2048 bytes on the hard disk (the size of a cluster). I put 14 of mine together in a file that is still only 1783 bytes – so it takes up just one cluster.

I use abbreviated names as labels to call particular applications, and I call the batch file DO.BAT. All I have to do is type, for example:

```
DO WS5
```

The batch file will then jump to the correct label and run *WordStar* for me. If no parameter is given, the batch file jumps to a list of available options. You could have this as a prettily formatted separate text file (with ANSI codes and IBM graphic characters to make it look more professional) if you like.

```
ECHO OFF
REM "DO.BAT" F H Bentley April 1991
IF %1==@ GOTO OPTIONS
GOTO %1
:BASIC
CD \BASIC
GWBASIC
GOTO END
```

```
:WIN
CD \WINDOWS
WIN %2
GOTO END
:WS5
CD \WS5
WS
:END
CLS
ECHO OPTIONS ARE:
ECHO WIN (FOR WINDOWS)
ECHO BASIC (FOR GWBASIC)
ECHO WS (FOR WORDSTAR)
:END
```

You can give DO.BAT more than one parameter – so that *Windows*, for example, will run an application immediately. The version of DO.BAT here is simply to demonstrate the principle – you can expand on it as much as you like.

F H Bentley  
Sheffield

This is a nice simple idea that makes a great deal of sense. My batch files all live in a directory called BATS, which is on the path so that MS-DOS can always find them. However, I can't always remember their names (and I currently have 25 in use) and typing DO is much quicker than having to type DIR \BATS \*.BAT to jog my memory.

TTL stands for Transistor/Transistor Logic, which is of course just as meaningless as the acronym itself. A TTL signal is either on or off, usually +5V or 0V.

In a colour TTL monitor there are four signal lines – Red, Green, Blue and Luminance. This gives 16 possible combinations – hence the 16 colours possible on a TTL colour monitor.

CGA and EGA adaptor cards produce TTL signals (as do Hercules and MDA). By contrast, VGA cards produce analogue signals that can vary over a wide voltage range. In practice each colour is generated as one of 64 possible values and converted to an analogue signal by the DAC (digital to analogue converter) on the VGA card.

As it's possible to damage a monitor by

feeding the wrong signals into it, these two monitor types have different connectors – a 9-pin 'D' type for TTL and a 15-pin 'D' type for analogue. The exception to this is some types of multi-synch monitors that can handle either signal type – usually by setting DIP switches on the back. It's important to get them right.

Acronyms are a problem – there are a

```
int c,sound=261;

port61=inp(0x61);      /*get value in port x061*/
port61|=03;            /*set bits 0 and 1 */
outp(0x61,port61);     /*write it back to turn on speaker*/

while((c=getch())!='q') /*change value to PIT*/
{
    new_sound(sound);
    if(c=='z') sound+=1;
    if(c=='x') sound-=1;
}

port61=inp(0x61);      /*turn speaker off*/
port61&=0xfc;
outp(0x61,port61);
}
/*****
new_sound(sound)        /*set up PIT for new sound*/
int sound;
{
port43=0xb6;
outp(0x43,port43);      /*tell PIT to expect new value*/

port42=(int) (freq/sound); /*determine note*/
outp(0x42,(port42&0xff)); /*send low byte*/
outp(0x42,(port42&0xff00)/256); /*send high byte*/
}

Programming the speaker directly looks even simpler, but this is a
bit of an illusion. The problem is that you have to look after every
single push and pull of the speaker cone, and this is impossible to
do from a high-level language, since you have to disable interrupts
to get a fast enough response.
```

Only port 61H is involved. Get the value there and turn off bit 0 (AND FEH) to set the speaker under direct control. Then XOR the value at port 61H with 02H and write it back with OUT 61H to

push the speaker cone in and out.

That much is simple to do, but getting the correct number of pushes and pulls to the speaker is a harder exercise. Also, the sounds produced will vary in frequency with the speed of the machine the program is running on. It takes some very clever programming to make any use of this technique and there are heavy penalties – nothing else can happen while you're heaving about on the speaker.



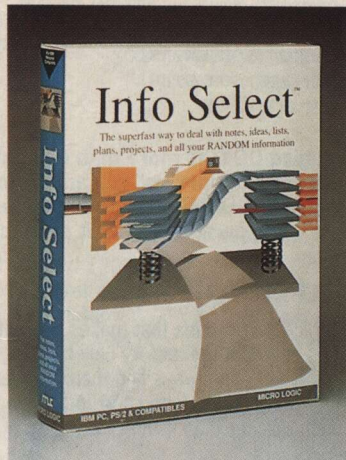
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## PRESS COMMENTS

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## TOO EASY BY HALF



In the April issue, you asked for examples of file redirection from inside programs. This simple program demonstrates how easy it is from JPI TopSpeed Modula 2.

```
PROCEDURE Print_Screen();
VAR
  Ch : CHAR;
BEGIN
  IO . WrStr ('Write to printer (Y/N)?');
  Ch := IO . RdChar();
  if (Ch= 'Y') OR (Ch = 'y') Then
    IO . RedirectOutput('PRN');
  END
END Print_screen;
```

There is no error detection and only redirection of the screen to the printer has been considered. However, there is full provision for redirection to files and peripherals in the library module IO.

H G Trevor  
London W9

Modula 2 is a much under-rated language – I guess it just came a little too late. Then again, it was tainted with the academic image that it inherited from Pascal. JPI's implementation appears to be about the best on the PC.

lot of them in computing and expanding them doesn't always help. Unfortunately, explaining them can take more text than there is room for in an article. Most of the common ones will eventually become generic terms. Who remembers or cares that scuba, radar and laser are all acronyms?

Of course, it helps if they're pronounceable, like DIP (Dual In-line Package), SIMM (Single In-line Memory Module) or BASIC (Beginners All-purpose Symbolic Instruction Code). So, if you're constructing an acronym, make sure it has at least one vowel, or folk will never use it in conversation.

## FREEDING THE BACKUP



I have upgraded from an XT to an AT, but the machine came back with the hard disk formatted to MS-DOS 3.3. All my data was backed up with MS-DOS 2.2, and the RESTORE utility will not work with the disks. PC Tools 6 won't help either.

Duncan Harris  
Dubai

An interesting problem. If you contact S&S International on (0442) 877877 the company will sell you a program called GREST (£10), which will do the job nicely. Alternatives are to find someone else with 2.1 on their machine, RESTORE your data, back it up using PC Tools and transfer it to your machine that way. The other alternative is to reformat your own hard disk to 2.1, restore the data, back it up with PC Tools, format it to 3.3 and restore it. GREST sounds the easiest solution.

## FOREIGN CHARACTERS



I have recently purchased a 386SX together with an Epson LQ400 printer. I'm happy enough with it, but I can't print characters such as square brackets and backslashes. This makes a complete mess of most of the on-disk manuals that I print out.

Moreover, there are also problems with my printscreen operations – they produce high-quality, 24-pin works of art, but they bear absolutely no resemblance to the beautiful Super

## VGA images on screen. Please help.

Frank Stringer  
London

The character problem is almost certainly caused by having the character set for Spain or Latin America selected instead of the UK set – pretty strange really since Epson sets them correctly for the country they will be sold in. The bank of DIP switches labelled FW1 enable different country character sets to be used. The setting for the UK is: 1 on, 2 off, 3 off. Check this with the self test routine – hold down the FF (form feed) button and turn the printer on.

The screen dump problem is more intriguing. The [PrintScreen] key doesn't work in graphics mode except in CGA, so are you talking about a text screen dump? If so, the previous explanation applies. If not, then I presume you're using an art package or suchlike and printing images from that. If the images are not printed correctly, it's because you haven't told the software package which printer you're using – or you have told it the wrong one. Re-install it (or use the setup or configuration menu if it has one) to tell it you have an Epson LQ400.

If, with the printer correctly configured and the software properly installed, you still get erroneous results, suspect a cable problem. Check by swapping your printer cable with a friend's (or buy one – you can buy a ribbon printer cable for as little as £5). If the problems still persist then the printer itself is at fault – though that's highly unusual these days.

## GONE MISSING



I have an XT machine with a single disk. I bought your April issue and was rather impressed with the SuperDisk, particularly the way it all works from menus. However, when I decided to copy some of the programs, I couldn't find them with DIR. Are they 'hidden' files?

J Moody  
Bristol

I'm going to presume that you're a relatively new PC user, and that with a single disk machine you haven't explored all the

## BASIC FEEDBACK



Many thanks to David Patient for pointing out that print statements in GW-BASIC can be redirected to the printer without using LPRINT (issue 55 page 276). I had worried round this problem for years without spotting the solution.

In fact things are even better, since the file number can be represented by a variable with the value of the variable deciding where the output goes. Instead of:

```
PRINT #1 "STRING"
PRINT #2 "STRING"
```

For the screen and printer respectively use:

```
PRINT #DEV "STRING"
```

where DEV is an integer variable. Output can be directed anywhere by simply changing the value of the variable.

On another note, consider the use of arrow (cursor) keys in GW-BASIC. There is no explanation in the manual that these keys return two character strings – the first being the

invisible NUL character (0). The following code snippet shows you how to detect cursor and other control key presses and differentiate between these and the ordinary character keys:

```
10 WHILE A$ <> "Q"
20   A$ = ""
30   WHILE A$ = "" : A$ = INKEY$ : WEND
40   PRINT ASC(LEFT$(A$,1)), ASC(RIGHT$(A$,1))
50   IF ASC(LEFT$(A$,1)) <> 0 THEN PRINT A$
60   PRINT
70 WEND
80 END
```

Note that you will have to clear the GW-BASIC function key assignments if you wish to use function keys in your own programs.

Douglas Steven  
Par  
Cornwall

Thanks for the thanks – I've passed them on.



# OH NO YOU CAN'T



If anyone wants to disable Execute or Run functions in applications that give users access to MS-DOS (allowing them to run a program from inside another program) they can do it by running the application from a batch file as follows:

```
ECHO OFF
SET COMSPEC=
CD \PROGDIR
PROGRAM
SET COMSPEC=C:\DOS\COMMAND.COM
```

Substitute your own directory and program name for those in lines four and five. I know this works because someone did it to me.

Phillip Dyer  
Farnham

A simple idea, and potentially quite useful. It's easy to crash a program by running a game or TSR (Terminate and Stay Resident) program from within it, and even some programs that claim they aren't necessarily TSRs (like *SIMON*, from Clockwork Software) will crash a machine if run from within another program.

What happens here is that the environment variable COMSPEC, which tells MS-DOS where COMMAND.COM is, is unset. Now, when a program tries to find COMMAND.COM to run another program, it just has to give up. It's essential to reset COMSPEC to whatever it was before – an easy way to do this is to add a line after ECHO OFF:

```
SET COMTEMP=%COMSPEC%
```

and then change the last line to:

```
SET COMSPEC=%COMTEMP%
```

possibilities of MS-DOS yet. Few users would bother to create sub-directories on a 360K floppy disk, but it makes sense for us to do it since it enables us to keep the different programs separate.

We put the different parts of the *SuperDisk* into sub-directories, with names that reflect the contents. What's happening here is that when you use the DIR command all you see is the PC PLUS batch file and sub-directory names. These look just like files since they are just files – but they contain information on the whereabouts of other files.

The convention is that sub-directory names do not have filetypes (though they can have). If you put a *SuperDisk* in the drive and type:

```
CD \UTILS
DIR
```

you will see the files in that directory. Similarly with \GAMES and \SHORTIES. To copy these files to another disk on a single disk machine type:

```
COPY A:\UTILS\*.* B:
```

Use the name of whichever sub-directory you're interested in – MS-DOS will prompt you for the disk to copy the files to. Unfortunately, this method will involve you in a disk swap for every file copied but at least it's straightforward.

## BATTY



I would like to know how to change a BAT extension to a COM extension. I would be very grateful for any help.

Ben Kinnaird  
Newent

A BAT program is just a list of instructions that has to be interpreted by COMMAND.COM every time it's run, a bit like a GW-BASIC program. BATtoCOM (Clockwork Software 0705 483217) and BATCOM (Ctrl-Alt-Deli 0908 662759) will both compile those instructions into a COM program that no longer needs interpreting, and this will generally run much faster. Also, both programs provide extra BAT commands for you to make use of, including some for colour.

## MR BIG



I have always understood that under MS-DOS 3.3 one was restricted to a maximum partition size of 32 Mbytes on any hard disk and that any extra space on the disk had to be allocated to logical drives in an extended partition. Yet the computer I use at work – an Apricot Xen-s running under MS-DOS 3.3 has a C-drive of 47 Mbytes. Obviously I am wrong in my understanding – please enlighten me.

Colin Griffiths  
Colwyn Bay

The usual way to get a larger primary partition under a version of MS-DOS prior to 4.0 is to change the sector size on the hard disk. While this works, it's a bit naughty, but many companies did it regardless.

The 32 Mbyte problem occurs because

earlier versions of MS-DOS only had 16 bits with which to identify sectors on the disk. Since each sector is usually 512 bytes, that gives 65,535 times 512 bytes of storage, 33,553,920 or 32 Mbytes (these numbers look much neater in hex – FFFF times 200 equals 1FFFE00). By monkeying with MS-DOS so that a sector becomes 1024 bytes, or 2048 bytes, you can double or quadruple (and so on) the amount of memory MS-DOS can keep track of.

This causes another problem though – MS-DOS can only track so many clusters (the minimum unit of file allocation). Although it uses 16 bits for this too, some of those bits are reserved, which means that each cluster must have more than one sector on a hard disk – increasing the sector size increases the cluster size too. Since, on average, you waste half a cluster with every file stored, you can end up with a lot more wasted space if you increase the

## FIRST READING



Please could you tell me how the PC knows what the disk format is when it reads it? On my machine it reads either 720K or 1.44 Mbyte perfectly happily. I don't suppose I really need to know as long as the computer does, but I'm intrigued.

Jim Collier  
Manchester

MS-DOS has a lot of flexibility built in – and this is one of the reasons why it can be awkward to get it working in the way you want it to. In the case of disks, whenever the PC logs a disk in – which it has to do every time you try to read from a new disk in a floppy disk drive – it first reads the boot sector. This is the very first thing on any disk so it can't miss it, whatever the format.

This boot sector contains a great deal of information about where the directories are, where the FAT (File Allocation Table) is and of what type and much more – including information on the format. In fact there's often nothing to stop you formatting a 3.5-inch disk to 160K, 180K, 320K or 360K if you like (these are the other supported floppy disk standards on the PC).

Oddly, many users who add 3.5-inch drives to XTs find that they can achieve nothing but a 360K format, even though the drives will read 720K disks formatted on other machines. Assuming that the 3.5-inch drive is drive B: the usual solutions are to add one of the following lines to CONFIG.SYS, either:

```
DRIVPARM= /D:1 /F:2 /H:2 /S:9 /T:80
```

which will tell MS-DOS that the B: drive is a 720K drive or:

```
DEVICE=C:\DOS\DRIVER.SYS /D:1 /F:2 /H:2 /S:9 /T:80
```

This sets up a logical drive D: which uses the same physical drive as drive B:. If you format a disk in drive D: it will be formatted to 720K. This works for 1.44 Mbyte drives as well.



sector size. Your Apricot uses 1K sectors – so they tell me.

## LISP



I am in search of a LISP compiler for the PC, but unfortunately with little success. Do any exist and who distributes them?

Liam Keating  
University of Durham

There are at least ten LISPs available for the PC, mostly American in origin. Golden Common Lisp appears to be something of a standard, so I'm told. The Software Paradise catalogue (0222 887521) lists several LISP implementations, but expect no support – the company sells on price.

If you need more help than just a package through the post, contact Grey Matter on (0364) 53499. This company deals in nothing but programming tools and languages.

## SMALL BUT PERFECTLY FORMED



I wrote the following DEBUG script based on David Patient's LINES.C program in the

November 1990 issue.

Although it should alter the screen to a 50-line display, when I execute it only 25 lines are displayed. The upper half of the screen is used, but the lower half remains blank. The whole thing looks like a very funny display.

```
nline50.com
rcx
la
a
mov al,02
mov ah,12
mov bl,30
int 10
mov ah,00
mov al,02
int 10
mov al,12
mov ah,11
mov bl,00
int 10
mov ah,4c
int 21
```

```
w
q
```



I tried Norton Utilities to alter the video mode and it succumbs to the same problem. QuickBASIC will set it, but it still acts strangely and if I shell out, it again has the same old problem.

I'd be interested in a DEBUG script for a usable 43-line mode too. I've tried this DEBUG script on a Dell Systems 200 and 325 (one mono VGA the other colour). Is it a problem with the Dell machines or with the code?

R Raveendran  
West Croydon

I tried this around the office (all VGA machines) and your DEBUG script works perfectly on an Apricot Qi, an NTS, a Falco and a Viglen. Only the office Elonex displayed the same problem as your Dell. It turns out that the program only works properly with version 4.xx of MS-DOS (it also works with MS-DOS 5.0 and DR-DOS 5.0).

Application programs are able to run in 43 and 50-line mode under earlier versions – as QuickBASIC proves – since they check how many lines they have available. MS-DOS does not appear to do so – does anyone have any ideas on making MS-DOS 3.xx use

# WISDOM OF SOLOMON



*As well as his usual hunt for bargains, Dr Alan Solomon looks at how much he can attach to his parallel port and the prices a company can charge for memory.*

Now that the tumbling prices of 33MHz 486 PCs have been announced at the *Which Computer?* show, Atomstyle is offering a system with a 40 Mbyte disk for £1,790. You can't get a system much faster than that, and it's just the job for a programmer with a slow compiler. Contact Atomstyle on 081-801 1838.

## PARALLEL POSSIBILITIES

Probably the ultimate in attaching things via the PC parallel port has been reached by Tekware on (0562) 882125. The company can now offer a parallel-SCSI (Small Computer Systems Interface) adaptor, which allows you to hang any SCSI device (such as

a CD ROM player or a high capacity drive) on a parallel port.

The downside is that you have to buy at least one peripheral from them to get it. The cheapest device is a floppy drive, which will set you back £500 for the drive plus the adaptor. The company also has an unusual mass storage device – a RAM disk – that can go up to 128 Mbytes, also attached via a SCSI port.

Those of us who prefer the Pascal programming language and have a yearning for OS/2 can now have both by talking to Prospero. This British company deserves far more recognition than it has so far achieved – £320 gets you an ISO-standard compiler that will give MS-DOS and OS/2 code. Contact Prospero on 081-741 8531.

I'm still with Borland's *Turbo Pascal*, but unless it brings out an OS/2 version soon, I might be tempted to switch. The main thing that Prospero doesn't have, is the kind of hyperbole that we have come to expect from the PC industry.

## POCKET MEMORY

There is a new version of the 'palmtop' DIP (alias Portfolio) PC. It's now available in a 512K version, but unfortunately you have to pay an extra £200 for the extra 384K, rather than the £20 or so that you might expect. The reason is that the extra memory currently has to be installed in the DIP by hand, rather than putting it in at manufacture. This all sounds rather crazy to me; surely it would make sense to persuade Atari, who make it, to put 512K in as standard in all the machines.


Talking of money, if you thought Postscript was expensive, you may be surprised to hear that you can get a cartridge for an HP Laserjet (but it must be a genuine HP) from David Pollard (0865 240048) for between £200 and £300. Alternatively, you can do it in software with *Freedom of Press* for £65. *Freedom of Press* is a software emulation of Postscript, which lets you persuade an HP Laser or even an Epson dot matrix to print Postscript.



the extra lines? The code is included on this month's *SuperDisk*, so feel free to play around with it.

To change to 43 line mode (on the machines it works with) you have only to alter the first line of the *DEBUG* script. Load *AL* with 1 instead of 2.

## COLOURFUL

 I have an EGA card with 64K of memory on board – is it possible to increase the amount of memory available to the board, and would this provide greater graphics resolution.

Mathew Lavender  
Harrogate

Quite simply, yes and sort of. And now for the long version of that answer – an EGA graphics adaptor has a maximum display resolution of 640 pixels across by 350 high. It is capable of displaying a maximum of 16 colours, and these require four bits each to define.


To find out how much memory we need to achieve this, we multiply 640 by 350 to get the number of bits for each colour, which comes to 224,000. Multiply by four for the colour planes, which gives 896,000 and divide by eight to get bytes, which gives 112,000, or around 110K.

With 64K, EGA will go into its highest resolution, but will only use two bits for each colour, giving just four colours – for the incorrigibly technically-minded colour planes 0 and 1 are mapped on to each other as are 2 and 3. This is achieved by using even byte pixel addresses to refer to

even numbered colour planes and odd byte pixel addresses to refer to odd numbered colour planes.

The original IBM EGA card required a piggyback card to take it to its maximum of 256K. Most clone cards have sockets for the extra chips. Taking it to 256K will give you two complete pages of 16-colour, high-resolution graphics. This enables two screen images to be held in video memory simultaneously. Different cards require different memory chips – if your documentation leaves you in any doubt, take the card to a dealer for upgrading.

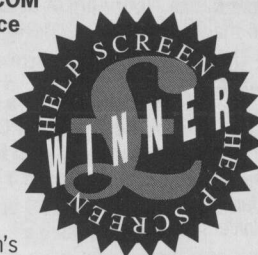
## DON'T DELETE

 This is a batch file that I find useful. It lists all the files in the current directory that don't have the file extensions that you supply in the command tail. Quite useful for concentrating on just a few odd files in a directory.

```
GECHO OFF
DIR > TP1
:LOOP
FIND /V /I " %1" TP1 > TP2
COPY TP2 TP1 > NUL
SHIFT
IF NOT "%1"==" " GOTO LOOP
TYPE TP2 | MORE
DEL TP? > NUL
```

The space before the %1 is important, without it any filename that contains the letters in the specified extensions will also disappear from the listing. Anyone running 4DOS instead of

**COMMAND.COM**  
should replace  
the space  
with a full  
stop.  
R W M  
Jones  
Cheshire



I'm sending you this month's *BATCOM* prize (donated by Ctrl-Alt-Deli) for this one because it's both clever and useful. It certainly had me foxed for a while. I'd forgotten that the /v parameter of the *FIND* utility makes it display lines that don't have the string in them.

I put the /i parameter in. It's only available in MS-DOS 4, but it's worth mentioning since it stops the search being case sensitive – *exe* will find 'exe' or 'EXE'. *DR-DOS* 5.0 doesn't have it, but then its version of *FIND* isn't case sensitive by default anyway, and 4DOS users get a lower case directory listing, so they don't have to remember to put the Caps lock on.

This would be even more useful to me if I could use it on any directory from any other directory, so I've made a second version in which the first three lines read:

```
*echo off
dir %1 >tp1
shift
```

In this version I have to give it a directory name and path as well as the filetypes I want to be excluded.











## The PC PLUS Fact Panel Guide




These days there's no such thing as a 'standard' PC – instead we've got a range of different disk sizes, graphics adaptors and hardware add-ons, such as mice, modems and memory boards. This makes the claim that a piece of software 'Runs on IBM Compatibles' a bit meaningless, so we're introducing a fact panel on all our reviews which shows exactly what hardware you need to run the program, and what optional equipment the program can make use of. The fact panel has four sections, as follows:


### 1. Display types.

This section shows the type(s) of screen display supported by the program. Remember that your PC's display type is determined by its combination of display adaptor and monitor, so for example a PC1640 will have a Hercules, CGA or EGA display depending on the MD, CD or ECD monitor in use.

The icons are as follows:



-  80x25 character text-only – runs on any IBM-compatible PC.
-  Displays Hercules monochrome graphics on Hercules-compatible machines.
-  Displays Colour Graphics Adaptor (CGA) quality graphics on CGA, EGA and VGA machines.
-  Displays Enhanced Graphics Adaptor (EGA) quality text/graphics on EGA and VGA machines.
-  Displays Video graphics Array (VGA) quality text/graphics on VGA machines only.
-  Displays Multi-Colour Graphics Array (MCGA) graphics on MCGA machines.
-  Displays PC1512 16-colour graphics on the PC1512 only.
-  Displays Tandy Graphics Adaptor graphics on Tandy compatible machines.
-   *Windows*

*Windows* and *GEM* are both Graphical User Interfaces, which adjust automatically to make the best use of   and  displays. Other types may also be supported. You may need to buy *Windows* or *GEM* separately.

Programs with just a  work on all IBM-compatible PCs, since all types of display adaptor support a standard text-only mode, which includes the 'IBM graphics character set' –






the boxes, lines and funny faces used by many programs. Monochrome systems may interpret colour text codes (or 'attributes') as flashing, underline etc.

Other icons refer to 'all points addressable' graphics displays, used in business graphics (e.g. *Lotus*-style spreadsheets), painting and drawing programs, desktop publishers, games and others.

A program may have more than one icon – for example,   means that the software works with both Hercules and CGA adaptors.





### 2. Issue Disks








This tells you what type of floppy disk the software is supplied on.

-  5.25", 360K floppy, or 1.2Mbyte if marked '1.2'.
  -  3.5", 720K floppy, or 1.4 Mbyte if marked '1.4'.
- One icon means only available on that disk type (though check with your dealer)
-  both types supplied as standard
  -  or  5.25 / 3.5 choice – see price for details.

### 3. Minimum Hardware requirements

Items in this section are mandatory – either the program won't run at all without them, or would be unuseable in practice. The icons are:

-  Single floppy
-  Twin floppy
-  Hard disk
-  80286 processor chip
-  80386 processor chip
-  Mouse

-  Joystick
-  Matrix printer
-  Laser printer (Note 1)
-  Telephone line and modem
-  Minimum free RAM, after MS-DOS and any resident programs are loaded.
-  Expanded Memory Specification (EMS) card (see Note 2)
-  Maths co-processor chip (e.g. 8087 for standard PCs, 80287 for ATs and so forth)

### 4. Other hardware supported

These items are not mandatory, but the program can make use of them. The icons are the same as those used in the minimum hardware section.

**Notes:** 1. Most laser printers will emulate Epson FX series matrix printers, so will work in basic mode with a matrix-only program. A laser driver indicates support for special fonts and high-resolution graphics. Always double check that your particular model of matrix or laser printer is supported.

2. There are various EMS standards around, the most popular being LIM EMS version 4.0. Check that your type is supported by the program.

### OUR VALUE VERDICTS

Product fact boxes also contain verdict ratings, in the range 0 - 5, covering four areas of the product – Range of Features, Overall Speed, Ease of use and Documentation – plus an overall Value verdict.

These ratings are made in the context of the program's price and intended position in the market, so a £25 filler which provides good sorting facilities might get a Range of Features rating of 4, while a £600 bells-and-whistles database which couldn't import text data might be marked down to three. The overall value verdict is made on the same basis. It is quite possible for a very expensive product to be excellent value for money because it really does do the job well, while a very cheap product might be poor value because it is too lacking in features to do anything at all.